What is CASA

CASA is used to study recorded video images of sperm through an extreamly powerful microscope. The images are then digitized and analyzed by a high-speed computer system (up to 60 frames per second) so that motility of individual sperm (and sperm populations) can be analyzed accurately.

The CASA system is so precise that it enables our Andrologist's to get a more accurate analysis by limiting the number of variables that exist with the manual analysis.

Why use Computer Assisted Semen Analysis ?

The quality and accuracy of manual microscopic semen analysis varies enormously from center to center and despite efforts to introduce standardization and quality control, it remains a time consuming and poorly reproducible process. Hence reliability of such reports are questionable.

Computer assisted semen analysis allows a very detailed determination of the parameters of sperm motility, the most important of which are:

- VCL – Curvilinear Velocity – the total distance the sperm moves in a time unit (μm/s)
- VSL – Straight Line Velocity (progressive velocity) – the distance the sperm moves along a straight line in a time unit (μm/s)
- VAP – Path Velocity – mathematically smoothed path along which the sperm moves in a unit of time
- ALH – Amplitude of Lateral Head Displacement (μm)

CASA
2100 Icasa Computer Assisted Semen Analyzer

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CASA
2100 Computer Assisted Semen Analyzer

Standard Equipment

fast

easy

performable in any laboratory

Laptop
- TOSHIBA
- Dell
- ASUS
- Lenovo

Trinocular Microscope

Camera

- Digital color CCD camera or similar

Table "Optional"

Color Printer

Accessories

Computer assisted semen analysis

mot

mrf

dna

vit

MOTILITY AND CONCENTRATION

MORPHOLOGY

DNA FRAGMENTATION
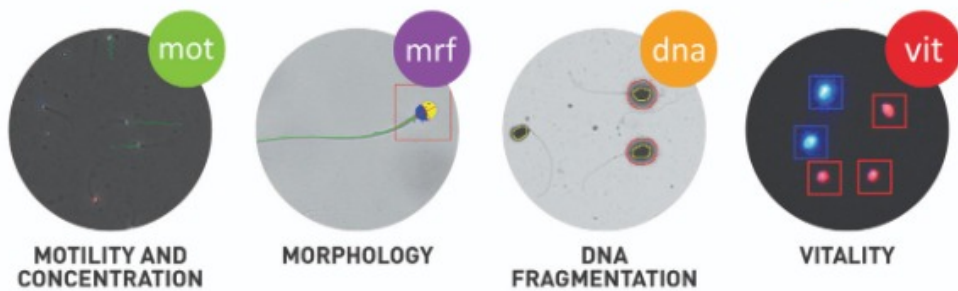
VITALITY

Other special analysis

Stool

CBC Cell Counter assistant

Urilab

2100 Scan CASA Computer Assisted Semen Analyzer
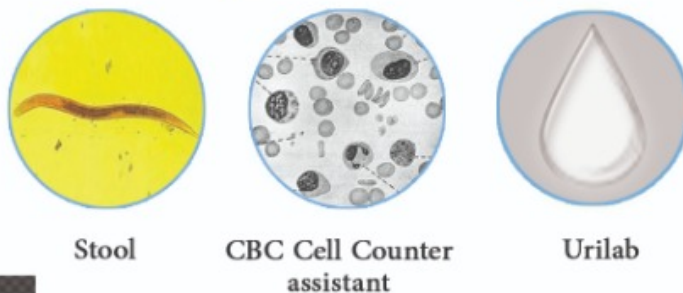
Summary of the modules

Motility and concentration

Main program for the analysis of sperm motility and concentration

DNA Fragmentation

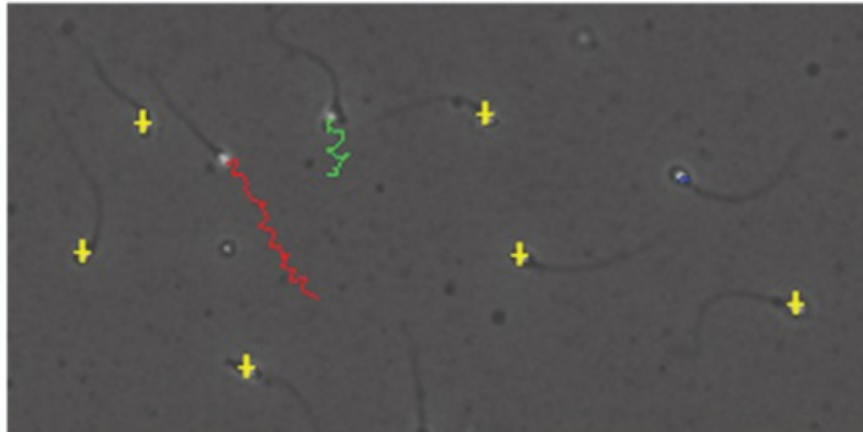Main program for DNA fragmentation analysis of sperm samples

Vitality

Main program for the vitality analysis with fluorescence.

Morphology

Main program for morphological and morphometric sperm analysis

Motility and Concentration

Set Patient Data Azoospermia		☐
Volume	4	ml
Dilution ratio	1/01	
Concentration	15	Million / ml
Ejaculate count	60	Million

Initial microscopic investigation

Aggregation	▼
Agglutination	▼

Celles Other Than Sperms

WBCs	0	/ ml
RBCs	2-6	/ H.P.F
Sperma. Cells	0	/ ml
Epithelial cells	0	/ ml

Pinheads

Total Pinheads	0	Million / ml

Squares Result details

	Square No.	Sperms	Pinheads
✓ ☑	1	30	0
☐	2	30	0
🔍 ☐	3	30	0
☐	4	30	0
✗ ☐	5	30	0

Concentration

motility and concentration is a module for the automatic analysis of the sperm motility and concentration in a semen sample.

Progressive sperm motility is extensively known to be related to pregnancy rates.

Motility must be assessed as soon as possible after liquefaction of the sample, preferably at 30 minutes, but in any case within one hour after ejaculation, as WHO recommends, to decrease the effects of dehydratation, Ph or changes in temperature.

CASA
2100 Icasa Computer Assisted Semen Analyzer

DNA Fragmentation

- After following a simple methodology, based on the chromatin dispersion around de core, different degrees of sperm DNA fragmentation can be observed.
- This module quantifies the number of sperms with fragmented and non fragmented DNA and the type of dispersion halo, showing its morphometry values.
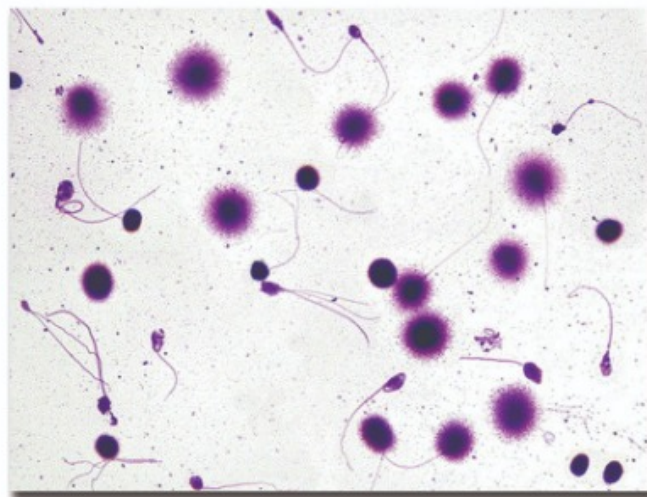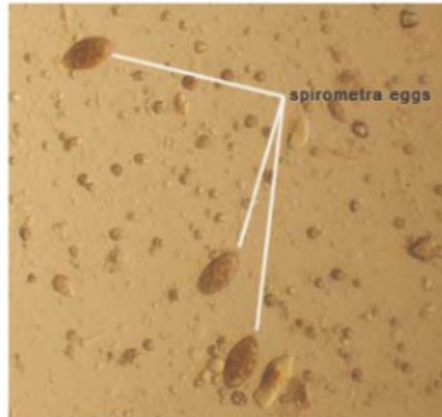
Sample Jar   Bag Sample

Take Sample   Wash Hands

Stool

Microscopic examination of Stool chemical analysis and generation of a digital sample

spirometra eggs

Urilab

Microscopic examination of Urine sediment and Urine chemical analysis and generation of a digital sample

Barcode NO 7	باركود المريض :	الاسم : اسيد/محمد السيد علي	
	Male	النوع :	السن : 33 Year
13/01/2015 م12:49	الوقت والتاريخ :		محول من :

Computer Assisted Urine Analysis

A. Physical Examination

Volume	Randum Sample	Colour	Amber Yellow
Aspect	Clear	Reaction	Slightly acidic
* Sp. Gravity		Blood	Nil

B. Chemical Examination

Albumin	Negative	Glucose	Negative
Acetone	Negative	Bilirubin	Negative
U.bilinogen	Normal trace	Nitrite	Negative
Blood	Negative		

C. Microscopical Examination

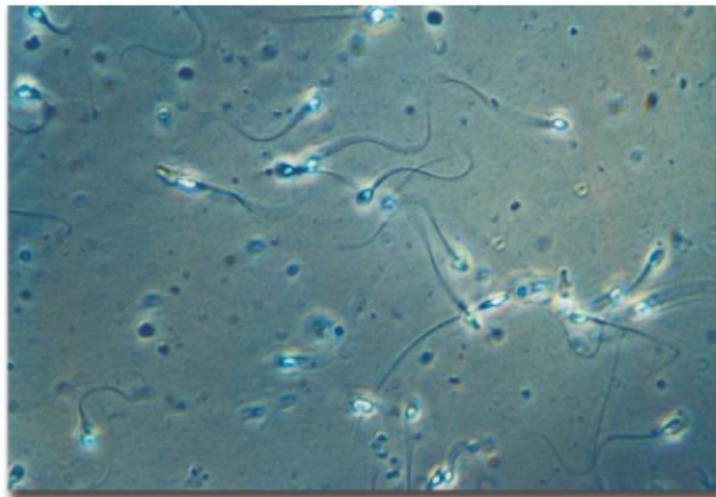| * Pus Cells		* R.B.Cs	
Epith. cells	Nil	Casts	Nil
Crystals	Nil	Parasites	Nil
Others	Nil		

Urine Film

8
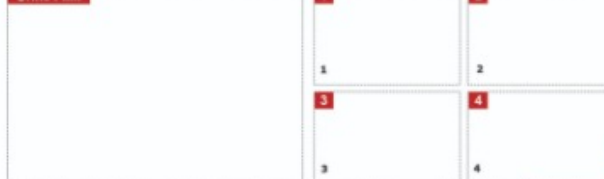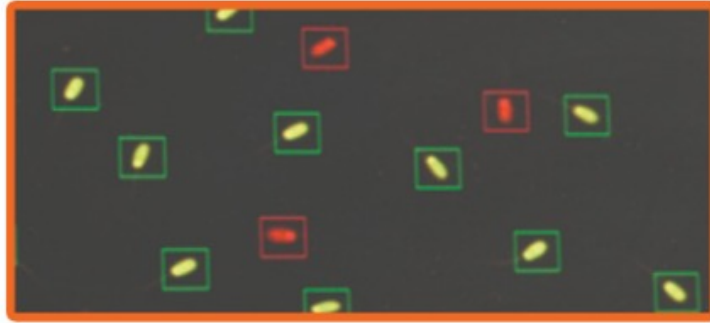
Vitality

Sperm Vitality is estimated by assessing the membrane integrity of the cells, and is fundamental for samples having less than 40% progressive motile spermatozoa. The percentage of the viable cells normally exceeds that of motile cells.

Report

Computer Assisted Semen Analysis (CASA)

The system follows WHO (2010) strict criteria for motility patterns & morphometric assessment of human semen.

ILab CASA software package

Barcode	‖‖‖‖‖‖‖‖‖‖ S-25120078	Ref. by	Prof Dr. Khaled Gadalla
Name	Mr. Mohamed Othman Zekry	Collection Date	2012/10/17 02:10:00 م
Age	31 Years	Analysis Date	2012/10/17 02:40:00 م

Specimen Description :

Volume	3.2	[N > 2,0]
PH value	7.4	[N : 7.2 - 8.0]
Color	Grey Opalescent	[white-gray]
Odor	Normal	[Normal]
Viscosity	Normal	[Normal]
Liquefaction time	30 min.	[N : 10 - 30 min.]
Liquefaction state	Complete	

Collection Info. :

Coll. Locations	Masturbation at lab	
Abestination	5 Days	[N: 3 - 7 days]

Agglutination & Aggregation :

Aggregation	Nil
Agglutenation	Nil
Other	Nil

Test result :

Test	Result	Status	Reference Value	Sperm Distribution
Concentration (million/ml)	68.33	PASSED	>= 15 (million/ml)	
Total sperm no. (million)	218.65	PASSED	>=39 (million/Ejaculate)	Immotile - 30 %
Progressive motility (PR)	48.00 %	PASSED	>=32 %	NP - 20 %
Total Motility (PR+NP)	64.00 %	PASSED	>=40 %	
Morphology index	12.00 %	PASSED	>= 4 % normal is accepted	PR - 50 %
Vitality	72 %	PASSED	>58 %	

Cells other than sperms :

White Blood Cells	0 - 1	< 5 /H.P.F	
Red Blood Cells	0 - 1	< 5 /H.P.F	
Spermatogenic cells	3 - 5	/H.P.F	
Epithelial cells	0 - 1	/H.P.F	

Pinheads : **2.7** million/ml

Pinheads sperms are not counted as spermatozoa or head defects because they possess no chromatin or head structure anterior to the basal plate.
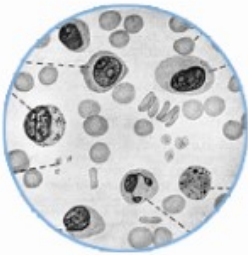
Comment :
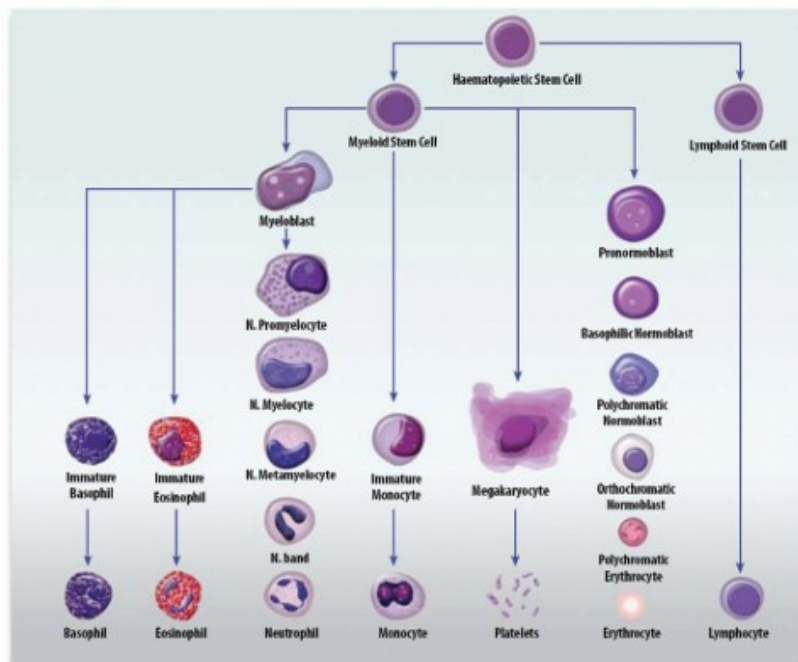
Normal seminal profile

The semen passed the W.H.O. strict criteria for count, motility and morphology.

CBC Cell Counter assistant

- The user decides the number types that the counter should contain and the name given to each one.
- It is possible to save more than one configuration.
- Once a configuration is saved, the report will be automatically filled with the obtained data.
- Selection of the counter from a list of available counters or creation of a new one.
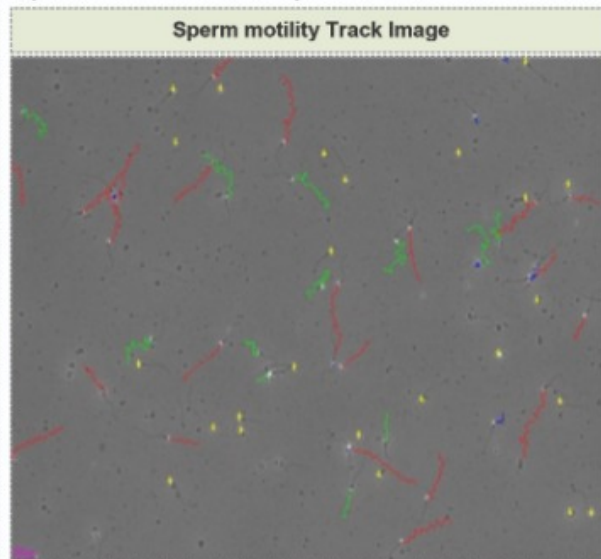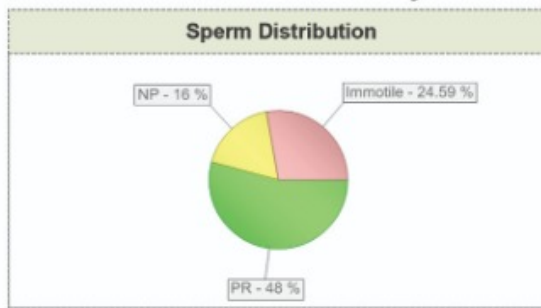- It is possible to capture images to include in the report.

Report

Computer Assisted Semen Analysis (CASA)

The system follows WHO (2010) strict criteria for motility patterns & morphometric assessment of human semen.
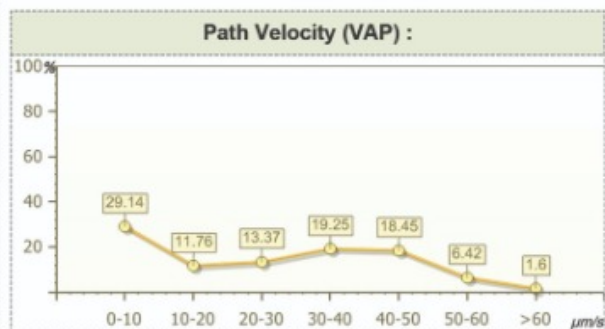
ILab CASA software package

Barcode	S-25120078	Ref. by	Prof Dr. Khaled Gadalla
Name	Mr. Mohamed Othman Zekry	Collection Date	2012/10/17 02:10:00 م
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Semen Analysis Charts (CASA - WHO 2010)

Sperm Distribution

NP - 16 %
Immotile - 24.59 %
PR - 48 %

Sperm motility Track Image

* the microscopic image is taken in real time.
* Each track is presented in colour code according to the type
  of spermatozoa W.H.O classification.

Progressive Velocity (VSL) :

100%, 80, 60, 40, 20

33.42, 11.76, 13.64, 19.25, 12.3, 7.22, 2.41

0-10 10-20 20-30 30-40 40-50 50-60 >60 μm/s

Track Speed (VCL) :

100%, 80, 60, 40, 20

20.05, 13.1, 6.95, 12.83, 14.97, 14.97, 17.11

0-10 10-20 20-30 30-40 40-50 50-60 >60 μm/s

Path Velocity (VAP) :

100%, 80, 60, 40, 20

29.14, 11.76, 13.37, 19.25, 18.45, 6.42, 1.6

0-10 10-20 20-30 30-40 40-50 50-60 >60 μm/s

Report

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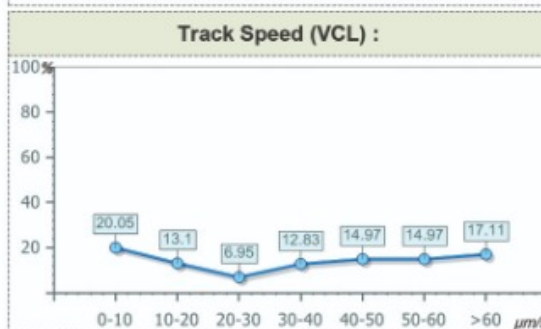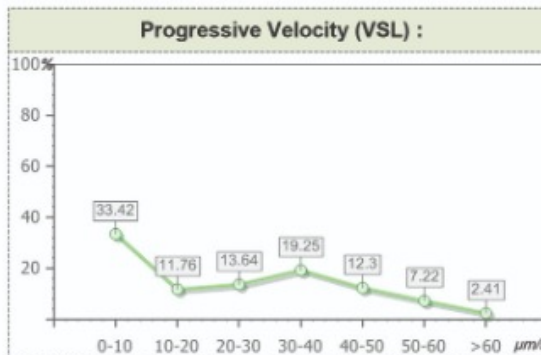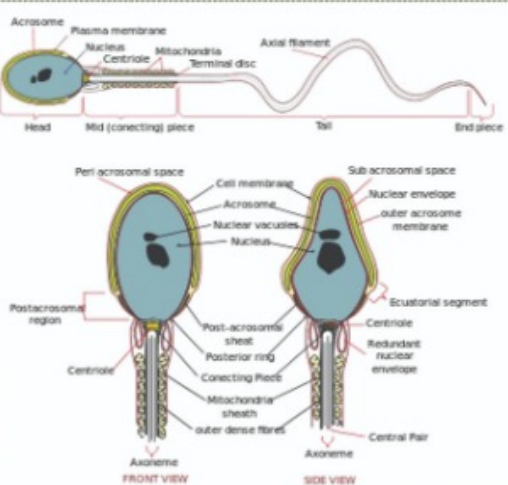
ILab CASA software package

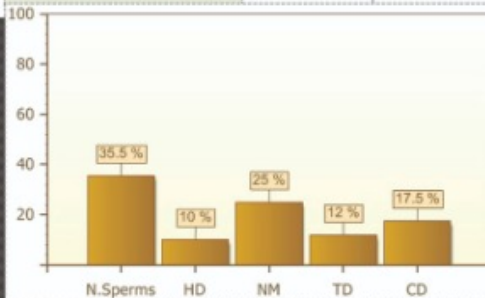| Barcode	S-25120078	Ref. by	Prof Dr. Khaled Gadalla
Name	Mr. Mohamed Othman Zekry	Collection Date	2012/10/17 02:10:00 م
Age	31 Years	Analysis Date	2012/10/17 02:40:00 م

SPERM CYTOMORPHOLOGICAL STUDY

Sperm Class Analyzer -Automatic System of sperm analyisi by computer (CASA)

Parameters	Result	Status	Reference Value	Morphology Chart
Normal Sperms	12.00%	PASSED	> 4% is accepted	
Terato Sperms	88.00%			T.Sperms - 88 %
MAI	1.75			N.Sperms - 12 %
TZI	1.42	PASSED	up to 1.6	
SDI	0.78	PASSED	up to 1.6	

* **MAI** Multiple Anomalies Index (MAI) : The mean number of anomalies per abnormal spermatozoon.
* **TZI** TeratoZoospermic Index (TZI) : Total number of defects divided by the number of abnormal sperms.
* **SDI** Sperm Deformity Index (SDI) : Total number of defects divided by the number of sperms counted.

Basic Classification	Total	Percentage	Chart Diagram of a human sperm cell
Normal Sperms	71	35.5 %	
Head defects (HD)	20	10%	
Neck & midpiece (NM)	50	25 %	
Tail defects (TD)	24	12 %	
Cytoplasm droplets (CD)	25	17.5 %	

Report

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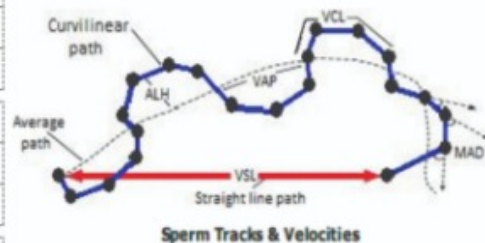| Barcode	[||||||| barcode |||||||] S-25120078	Ref. by	Prof Dr. Khaled Gadalla
Name	Mr. Mohamed Othman Zekry	Collection Date	2012/10/17 02:10:00 م
Age	31 Years	Analysis Date	2012/10/17 02:40:00 م

CONCENTRATION AND MOTILITY ANALYSIS

Dynamic Parameters Report (I) :

Test	Conc. (million/ml)	Total number (million)	Percentage %	Reference Value
Tested sperm	68.33	218.65	100	>= 15 (million/ml)
Total motility (PR+NP)	43.73	139.93	64.00	>=40 %
Progressive motility (PR)	32.79	104.92	48.00	>=32 %
Non progressive (NP)	10.93	34.97	16.00	
Immotile (IM)	24.59	78.68	36.00	<50 %

* Progressive motility (PR)   : spermatozoa moving actively, either linearly or in a large circle, regardless of speed.
* Non-progressive motility (NP) : all other patterns of motility with an absence of progression, i.e. swimming in small circles,
                                  the flagellar force hardly displacing the head, or when only a flagellar beat can be observed.
* Immotile (IM)   : no movement.

Dynamic Parameters Report (II) :

Parameters	values	Description
VCL [µm/s]	46.15	Curvilinear velocity
VSL [µm/s]	29.07	Straight line Velocity
VAP [µm/s]	33.19	Average Path Velocity
MAD[']	45.83	Mean Angular Degree
ALH [µm]	4.54	Amplitude of Lateral head Disp.
BCF [Hz]	4.70	Beat-cross Frequency
LIN	62.50 %	Linearity (VSL/VCL)
WOB	71.97 %	Wobble (VAP/VCL)
STR	85.42 %	Straightness (VSL/VAP)

Sperm Tracks & Velocities

Report

Computer Assisted Semen Analysis (CASA)

The system follows WHO (2010) strict criteria for motility patterns & morphometric assessment of human semen.

ILab CASA software package

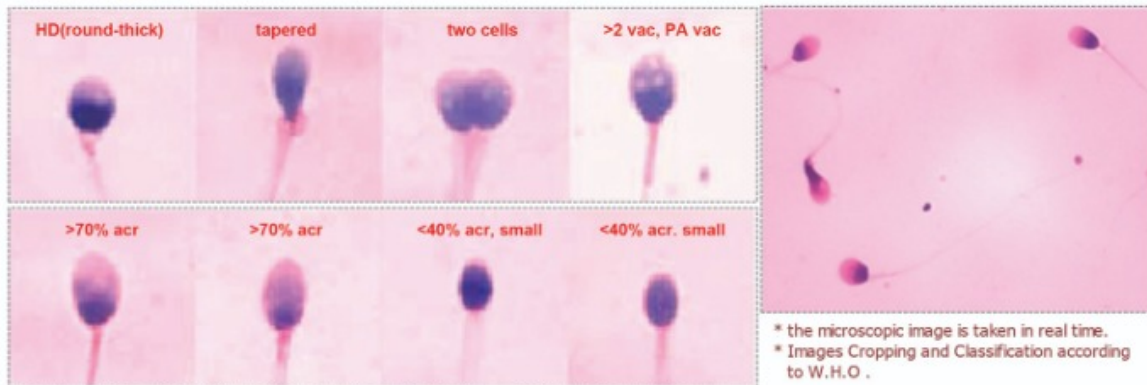| Barcode		S-25120078	Ref. by	Prof Dr. Khaled Gadalla
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SPERM CYTOMORPHOLOGICAL STUDY

Sperm Class Analyzer -Automatic System of sperm analyisi by computer (CASA)

Normal Sperms

Terato Sperm

HD(round-thick)   tapered   two cells   >2 vac, PA vac

>70% acr   >70% acr   <40% acr, small   <40% acr. small

* the microscopic image is taken in real time.
* Images Cropping and Classification according to W.H.O .

MORPHOMERIC VALUES

Class	Head Length (um)	Head Width (um)	Length/Width (%)	Head Area (um)	Head Perimeter(um)	Acrosome (%)
Mean of Normal Sperm	4.46	2.31	1.94	8.09	11.55	22.30
Mean of Terato Sperm	4.17	2.33	1.82	43.73	11.00	19.02
Reference values	4 - 5.5	2.5 - 3.5	1.5 - 1.75	7.85 - 15.1	10.8 - 14.9	40 - 70